

Appl. No. 10/782,545
Amdt. Dated February 8, 2006

Attorney Docket No.: NSL-025
Reply to Office Action of November 8, 2005

COMPLETE LISTING OF ALL CLAIMS

Kindly amend claims 2, and 22 and add new claims 35-48 as shown in the listing of claims below. Please cancel claims 6-13 and 24-34. This listing of claims will replace all prior
5 versions, and listings of claims in the application.

1. (canceled)

2. (currently amended) A method for treating a substrate surface, the method comprising the steps of:

10 coiling one or more substrates into one or more coils in such a way that adjacent turns of the coils do not touch one another and define a gap that allows for flow between adjacent turns of the coils;

placing the one or more coiled substrates in a treatment chamber; and
in the treatment chamber, treating substantially an entire surface of the one or
15 more coiled substrates with a surface treatment process, wherein the surface treatment process includes one or more atomic layer deposition (ALD) reactions;

wherein at least one or more of the substrates comprises a flexible, planar elongated member.

20 3. (original) The method of claim 2 wherein the one or more ALD reactions include exposing the surface of the coiled substrate to a reactant vapor of the type MCl_x , where M is a metal and x is an integer from one to four.

25 4. (original) The method of claim 3, wherein the one or more ALD reactions include exposing the surface of the coiled substrate to water vapor.

5. (original) The method of claim 3 wherein MCl_x is $TiCl_4$.

Claims 6-13 (canceled)

Appl. No. 10/782,545
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14. (previously presented) The method of claim 2 wherein coiling the substrate includes attaching an end of a roll of substrate material to a carousel, rotating the carousel while unrolling the substrate material from the roll to coil the substrate around the carousel, and placing one or more spacers between adjacent layers of the coiled substrate before
5 the carousel completes a turn.

15. (original) The method of claim 14 wherein each spacer touches a back surface of the substrate but not a front surface of the substrate.

10 16. (original) The method of claim 14 wherein placing one or more spacers includes stacking one or more spacers on top of one another.

17. (previously presented) The method of claim 2 wherein coiling the substrate includes attaching an end of a roll of substrate material to a carousel, moving the roll of
15 substrate material around the carousel while unrolling the substrate material from the roll to coil the substrate around the carousel, and placing spacers between adjacent layers of the coiled substrate before the roll completes a turn about the carousel.

18. (previously presented) The method of claim 2 wherein the one or more
20 substrates include two or more substrates coiled side-by-side on a carousel.

19. (previously presented) The method of claim 2 wherein coiling one or more substrates into one or more coils in such a way that adjacent turns of the coils do not touch one another includes placing a spacer tape between adjacent turns of the substrate.
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20. (original) The method of claim 19 wherein the spacer tape is orientated substantially parallel to a length of the substrate.

21. (original) The method of claim 19 wherein the spacer tape includes one or
30 more passages running substantially along a width of the spacer tape.

Appl. No. 10/782,545
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22. (currently amended) A method for treating a substrate surface, the method
comprising ~~the steps of~~:

coiling one or more substrates into one or more coils in such a way that adjacent
turns of the coils do not touch one;

5 placing the one or more coiled substrates in a treatment chamber; and
in the treatment chamber, treating substantially an entire surface of the one or
more coiled substrates with a surface treatment process,

wherein coiling one or more substrates includes attaching two substrates together
back-to-back to form a dual substrate and coiling the dual substrate.

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23. (original) The method of claim 22, further comprising separating the two
substrates after they have been treated in the treatment chamber.

Claims 24-34 (canceled)

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35. (new) The method of claim 2 wherein the surface treatment creates a
continuous layer on at least one side of the substrate from one adjacent turn to another.

36. (new) The method of claim 2 wherein the elongated member has an
20 uncoiled length greater than a width of the chamber.

37. (new) The method of claim 2 wherein at least about 500 square feet of at
least one of the substrates is coated per minute.

25 38. (new) A method for treating a substrate surface, the method comprising:
coiling one or more substrates into one or more coils in such a way that adjacent
turns of the coils do not touch one another;
placing the one or more coiled substrates in a treatment chamber; and
in the treatment chamber, treating substantially an entire surface of the one or
30 more coiled substrates with a surface treatment process, wherein the surface treatment process
includes one or more atomic layer deposition (ALD) reactions;

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wherein at least one or more of the substrates comprises a flexible, planar elongated member;

wherein the surface treatment process using one or more coiled substrates has an effective throughput at least 2 times greater than the same process using an uncoiled substrate that can fit in the same chamber and undergo the ALD reactions;

wherein the effective throughput of the treatment chamber comprises a total surface area treated per unit time in a single batch process.

39. (new) The method of claim 38 wherein at least about 500 square feet of the one or more substrates is coated per minute.

40. (new) The method of claim 38 wherein at least about 500 to about 5000 square feet of the one or more substrates is coated per minute.

41. (new) The method of claim 38 wherein at least about 10 to about 100000 square feet of the one or more substrates is coated per minute.

42. (new) The method of claim 38 wherein the effective throughput is at least 10 times greater than the same process using the uncoiled substrate that can fit in the same chamber.

43. (new) The method of claim 38 wherein the effective throughput is at least 100 times greater than the same process using the uncoiled substrate that can fit in the same chamber.

44. (new) The method of claim 38 wherein the effective throughput is at least 1000 times greater than the same process using the uncoiled substrate that can fit in the same chamber.

45. (new) The method of claim 38 wherein the effective throughput is at least 2300 times greater than the same process using the uncoiled substrate that can fit in the same chamber.

Appl. No. 10/782,545
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46. (new) The method of claim 38 wherein the elongated member has an uncoiled length greater than a width of the chamber.

47. (new) The method of claim 38 wherein an area of at least one of the
5 substrates being treated in the chamber is greater than a cross-sectional area of the chamber.

48. (new) The method of claim 38 wherein the substrate is a metallic, conductive substrate.

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